

REMARKS

Applicants thank the Examiner for the due consideration given the application. No new matter is believed to be added to the application by this Amendment.

Status Of The Claims

Claims 1-17 are pending in the application. Claim 3 has been amended to improve its language to clarify that chlorine or bromine are contained in the ammonium salts. Claims 6-8 and 14 have been amended to improve their language. Claims 15 and 16 find support at page 6, lines 17-20 of the substitute specification. Claim 17 finds support at page 11, lines 12-14 of the substitute specification.

Rejection 35 U.S.C. §112, First Paragraph (Paragraph 1 of the Office Action)

Claims 1, 2, 7, 8 and 10-14 are rejected under 35 U.S.C. §112, first paragraph as not being enabled. Applicants traverse.

Claim 1 of the invention recites a conductive urethane composition that contains a polyurethane obtained by a poly-addition reaction of polyol and polyisocyanate. In the Office Action, the Examiner asserts that it is not clear whether the polyurethane itself is electrically conductive.

However, the polyurethane itself is electrically conductive, as is shown by the specific resistance value of $10^{8.0} (\Omega \cdot \text{cm})$ of Example 3 in the specification, and this resistance value is much lower than that of the insulating rubber ($10^{14} \sim 10^{15} \Omega \cdot \text{cm}$). That is, the organic ionic-conductive agent (see claim 3) can be added to further enhance the conductivity, if necessary.

As a result, claims 1, 2, 7, 8 and 10-14 are enabled so that one having ordinary skill in the art can practice the invention without undue experimentation.

This rejection is overcome and withdrawal thereof is respectfully requested.

Rejection Of Claim 2 Under 35 U.S.C. §112, First Paragraph (Paragraphs 2-3 of the Office Action)

The Examiner rejects claim 2 under 35 U.S.C. §112 first paragraph by asserting that there is inadequate written description of JIS K6262, JIS K6911 and JIS K-6253. The Examiner further rejects claim 2 under 35 U.S.C. §112 first paragraph as not being enabled for JIS K6262, JIS K6911 and JIS K-6253. Applicants traverse.

However, these Japanese Industrial Standards are well known and would be known as such by one having ordinary skill. As a result, referring to well known industrial standards is in full compliance with the written description

requirement. Also, one having ordinary skill in the art would readily be able to obtain these industrial standards to thus practice the invention without undue experimentation.

These rejections are overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. §112 Second Paragraph (Paragraph 4 of the Office Action)

Claims 3-9 and 14 are rejected under 35 U.S.C. §112 second paragraph as being indefinite. Applicants traverse.

In the Office Action, the Examiner asserts that in claim 3, the term "containing chlorine or bromine" is not clear as to whether it modifies the term "organic ionic-conductive agent" or "ammonium salts." However, claim 3 has been amended to clearly set forth that the chlorine and bromine are contained in the ammonium salts. Claim 3 is thus clear.

In claim 6, the Examiner desires a clarification of whether the "0.5%" is a weight percentage and whether that represents 0.5 weight% of the organometallic salt. However, claim 6 has been amended to clarified to set forth 0.5 mol% of the organometallic salt. Claim 6 is thus clear.

The Examiner also asserts that the "50 wt%" limitation in claim 7 is not clear. However, claim 7 has been amended to clearly set forth "said polyether

polyol contains ethylene oxide and/or propylene oxide at not less than 50 wt% of ethylene oxide and/or propylene oxide units present in the polyether glycol.”

Regarding claim 8, the Examiner asserts that the language “as a base thereof” is not understood. However, claim 8 has been amended to clearly recite “said polyether polyol comprises polypropylene glycol as a main component.”

The claims are thus clear, definite and have full antecedent basis. This rejection is overcome and withdrawal thereof is respectfully requested.

Rejections under 35 U.S.C. §103(a) (Paragraphs 6-9 of the Office Action)

Claims 1-10 and 12-14 are rejected under 35 U.S.C. §103(a) as being obvious over Vreeland ‘001 or ‘457 (U.S. Patent 5,541,001; U.S. Patent 5,571,457) or Gloyer (U.S. 2001/0046576) each in view of Barksby (U.S. Patent 6,420,445) and Knobel (U.S. Patent 5,110,669). The Examiner adds the teachings of Nogami (U.S. Patent 5,618,646) or Priebe (U.S. Patent 5,869,188) to the foresaid rejection to reject claim 11. Applicants traverse.

The Present Invention And Its Advantages

The present invention pertains to a conductive urethane composition and a conductive roller composed of the conductive urethane composition. More particularly, the present invention improves the mixing of the urethane composition that can be effectively used for conductive rollers such as a

charging roller, a developing roller, a toner supply roller, or a transfer roller of a copying machine or a printer.

One of the many novel features of the present invention's conductive urethane composition rollers resides in a low electric resistance of less than $10^{9.0} \Omega \cdot \text{cm}$ (claim 2). In the invention, the average value of non-saturation of the constituent polyether polyol is set to not more than 0.025 milliequivalents/g.

The present invention has many embodiments, and a typical embodiment can be found in claim 1: "A conductive urethane composition comprising polyurethane obtained by a poly-addition reaction of polyol and polyisocyanate, wherein polyether polyol is used as said polyol; and an average value of a non-saturation degree of said polyether polyol is set to not more than 0.025 milliequivalents/g."

Distinctions Of The Invention Over The Applied Art

All of the cited art fails to disclose or suggest the 0.025 milliequivalent/g limit of non-saturation recited in claim 1 of the present invention.

Vreeland '001 pertains to a polyurethane suitable for a role that is formed by reacting a polyisocyanate polymer, a polyol and a conductivity control agent that is an ammonium tetrahaloferrate salt.

Vreeland '457 pertains to the polymeric material formed from a polyurethane obtained by reacting a polyisocyanate polymer with a polyol

blended with a ferric halide complex.

Gloyer pertains to a polyurethane elastomer formed from a polyisocyanate prepolymer and a polyether polyol prepolymer (claim 1). Gloyer, in claims 2 and 3, recites polyol charge-control agents.

Vreeland '001, Vreeland '457 and Gloyer all fail to disclose a degree of unsaturation of the polyether polyol that is not more than 0.025 milliequivalents/g (claim 1 of the present invention). The Examiner unequivocally admits to this failure of the primary references in paragraph 7 of the Office Action.

Also, the Vreeland patents use iron compounds as a charge control agent. Gloyer uses a conductive polyol as the charge control agent. In contrast, the present invention preferably uses organic ionic-conductive agents that are organometallic salts which preferably have fluoro groups and/or sulfonyl groups. The preferred examples of organometallic salts are found at page 11, lines 12-14 of the substitute specification (see claim 17).

At paragraph 7 of the Office Action, the Examiner unequivocally admits that the primary references fail to specifically recited the present invention's claimed polyether polyol having the claimed degree of unsaturation.

The Examiner then turns to Barksby for teachings pertaining to unsaturation. Barksby column 7, line 44 mentions "low unsaturation polyoxypropylene glycol." However, Barksby fails to disclose the 0.025

milliequivalent/g limit of non-saturation recited claim 1 of the present invention.

The Examiner refers to columns 7 and 8 of Knobel for teachings pertaining to ionizable salts. However, Knobel fails to specifically disclose the lithium salts cited at page 10, lines 17-19 of the specification and set forth in claim 17.

The Examiner turns to Nogami for teachings pertaining to the treatment of the metal shaft to reject claim 11. However, these teachings of Nogami fail to address the deficiencies of the other cited art in suggesting a claimed embodiment of the present invention.

That is, all of the cited art utilized by the Examiner fails to teach or suggest claim 1's recitation of "an average value of a non-saturation degree of said polyether polyol is set to not more than 0.025 milliequivalents/g." As a result, the cited prior art fails to teach or suggest each and every element of claim 1 of the present invention. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All the words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

As a result, one having ordinary skill in the art would not be motivated

by Vreeland '001 or '457, Gloyer, Barksby, Knobel, Nogami and Priebe to produce a claimed embodiment of the present invention. A *prima facie* case of obviousness has thus not been made.

Further, even if one assumes *arguendo* that the cited art is sufficient to allege *prima facie* obviousness, this obviousness would be fully rebutted by the unexpected results shown in the Examples of the present invention for such properties as low staining, picture quality and uniformity of electrical resistance. The advantages of the invention are thus clear.

These rejections are overcome and withdrawal thereof is respectfully requested.

Information Disclosure Statement

The Examiner is thanked for considering the Information Disclosure Statement filed July 30, 2003 and for making the initialed PTO-1449 form of record in the application in the Office Action mailed March 22, 2005.

Prior Art

The prior art cited but not utilized by the Examiner indicates the status of the conventional art that the invention supercedes. Additional remarks are accordingly not necessary.

The Drawings

The Examiner is respectfully requested to indicate whether the drawing figures are acceptable in the next official action.

Foreign Priority

The Examiner has acknowledged foreign priority and noted that a certified copy of the priority document has been received in the Office Action mailed March 22, 2005.

Assignment

The Assignment was recorded on July 30, 2003 at reel 014362, frames 0265-0267.

Conclusion

The Examiner's rejections have been overcome, obviated or rendered moot. No issues remain. The Examiner is accordingly respectfully requested to place the application in condition for allowance and to issue a Notice of Allowability.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No.42,593) at the telephone number of the undersigned

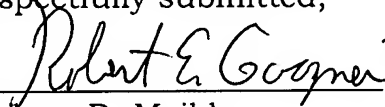
below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a three (3) month extension of time for filing a reply in connection with the present application, and the required fee of \$1020.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

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Respectfully submitted,

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